

**SIGNAL PROCESSING APPARATUS AND METHOD, AND
COMMUNICATION SYSTEM UTILIZING SAME**

Abstract

A communication system, a method of and an apparatus for communicating messages. N messages are transmitted from an originating station to a relaying station in a signal with frequencies within a bandwidth B , with each of the N messages having frequencies within a unique frequency band. Messages with adjacent frequency bands have the same or different bandwidths. At the relaying station, the messages are separated into groups of messages having the same bandwidth, where all messages in any group occupy non-adjacent frequency bands, and the messages of each group are then combined. Each combined group of messages is applied to a separate amplifier. Two or more messages of the same bandwidth may share a common traveling wave tube amplifier. Each amplified group of messages is then separated into separate messages which are transmitted to respective receiving stations.